



## GS recipe library

### Application

20% low fat spread is used as a spread on bread.



### Characteristics

Homogenous and spreadable at refrigerator temperature, pleasant flavour and mouth-feel, quick melt-down in the mouth are typical characteristics.

Low fat products, such as 20% spread, should exhibit similar characteristics as full fat products. However, usually low fat spreads are more unstable due to the lower content of fat. When protein is used in the formulation, starches and hydrocolloids are normally used as stabilisers. The consumption of reduced and low fat products has increased and intensive research is made in processing and ingredients in order to achieve better low fat products.

### Recipe

#### Fat phase in %

Interesterified fat blend MP 40°C	4.9
Liquid oil	14.3
Emulsifier (mono-and di-glyceride)	0.5
Emulsifier (polyglycerol poly ester e.g. PGPR)	0.3

Normally colour is added

#### Aqueous phase in %

Water	75.7
Hydrocolloid (e.g. Alginate)	2.0
Salt	1.2
Skim milk powder	1.0
K-sorbate	0.1

pH adjusted to 4-5 by means of citric acid.

Normally flavour is added not only to the fat phase but also to the aqueous phase.

#### Solid fat content in %

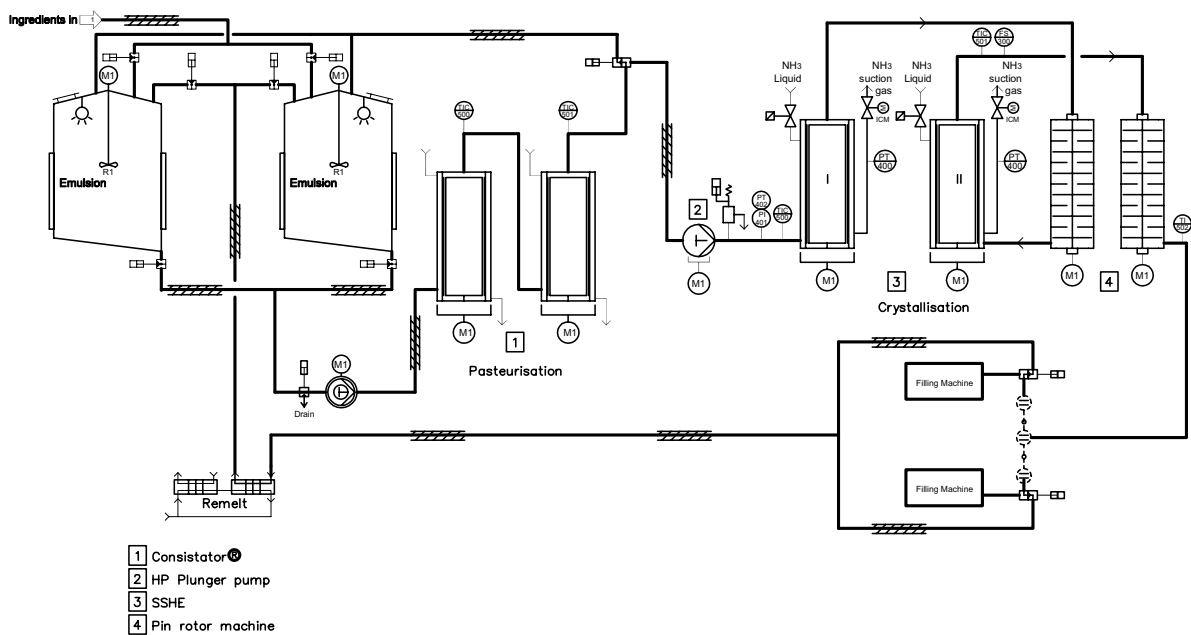
10°C	17.0
20°C	10.0
30°C	3.0
40°C	0.0

#### Melting point

Approximately	26-28°C
---------------	---------

### Processing

- The ingredients for the aqueous phase are mixed and heated according to the specification of the stabilizer used.
- The ingredients for the fat phase is melted under agitation, typically the highest melting fats are added first and liquid oil last. The fat phase is then tempered to approximately 5-8°C higher than the melting point of the fat phase.
- Emulsifiers, which are mixed into liquid oil in the proportion 1:5, are heated and melted at a temperature approx. 5-8°C higher than the melting point of the emulsifiers, and added to the fat phase.
- Flavour and colours are added according to solubility.
- The aqueous phase is added under agitation to the fat phase.
- The complete emulsion is pasteurised which typically involve heating to 75-80°C (holding time 15-20 sec only for high capacity) and cooling to 45-50°C or 5-8°C higher than the melting point of the fat phase.
- The emulsion is crystallised according to the flow diagram below.
- The 20% spread is stored at refrigerator temperature.



## Typical quality deficiencies

We recommend the following changes in processing if the below mentioned quality deficiencies occur during or after processing:

### Too hard at the wrapping machine

- Cool more intensively in the first cooling section and/or less intensively in the last cooling section of the SSHE
- Increase the rotation speed in the pin rotor machine
- Ensure proper water circulation in the jacket of the pin rotor machine

### Brittle

- As described above
- Increase the total volume of kneading units, i.e. pin rotor machine

### Grainy (small rice-like grains)

- Increase the remelt temperature of the return product
- Ensure proper pasteurisation profile
- Cool less intensively in the first cooling section of the SSHE

### Lumpy (lumps of different sizes)

- Increase the rotation speed in the pin rotor machine
- Ensure proper crystallisation in the first cooling section of the SSHE
- Ensure proper water circulation in the jacket of the pin rotor machine

### Greasy or too soft at filling or wrapping machine

- Decrease the rotation speed in the pin rotor machine and/or decrease the residence time in the kneading unit(s).
- Cool less intensively in the first cooling section of the SSHE and/or more intensively in the second cooling section of the SSHE

### Oily appearance or too shiny surface

- Decrease the rotation speed in the pin rotor machine and/or decrease the residence time in the kneading unit(s).